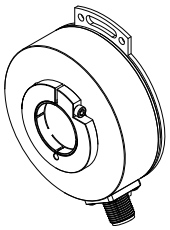
1. K77 Incremental Optical Encoder (Through shaft)

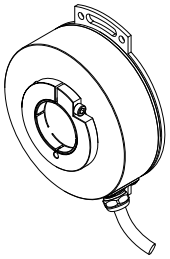
1.1 Introduction：

K77 is an ultra-thin through shaft design, unique flexible spring plate install, multiple electrical interfaces, protection grade up to IP65, compact, easy to install, and can meet the user' s requirements of environment and limited space.

K77-C



K77-T



1.2 Feature:

- Encoder external diameter Ø77mm, thickness 31mm, diameter of shaft up to Ø30mm, achieve ultra-thin miniaturization;
- Ring locking mounting structure;
- Adopt non-contact photoelectric principle;
- Reverse polarity protection;
- Short circuit protection;
- Multiple electrical interfaces available;
- Resolution up to 10000PPR.

1.3 Application:

Motor,CNC and other industrial automation

1.4 Connection:

- Radial socket (M12 8pin male socket)
- Radial cable (standard length 1M)

1.5 Protection:

IP65

1.6 Weight:

About 400g

2. Model Selection Guide

2.1 Model composition(select parameters)

K77-	T	6	C	1024	Q30			-	000
Product model series	Connection method: C=Radial socket (M12 8pin male socket) T=Radial cable	Output phase: 1=A 2=A+B 3=A+B+Z 4=A+$\overline{A}$+B+$\overline{B}$ 6=A+B+Z +$\overline{A}$+$\overline{B}$+$\overline{Z}$	Electrical interface: N=OC(NPN)❶ NH=OC(NPN)❷ F=Push-pull❶ FH=Push-pull❷ C=TTL (DC5V,26LS31) E=HTL (DC8-30V) L=TTL (DC5V, 26C31)	Resolution:(PPR) 500； 512； 1024； 1000； 2048； 2000； 2500； 4000； 4096； 5000； 8000； 8192； 10000	Diameter of shaft (through hole): Q25=Ø25mm Q30=Ø30mm Other shaft diameter can be customized (max Ø30mm)	Supply voltage: Blank=DC5V H=DC8-30V	Special requirement: Blank=❸		Management No.

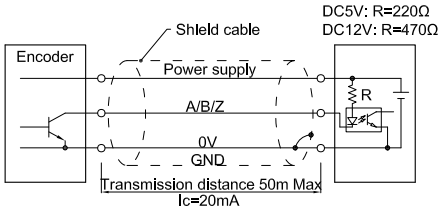
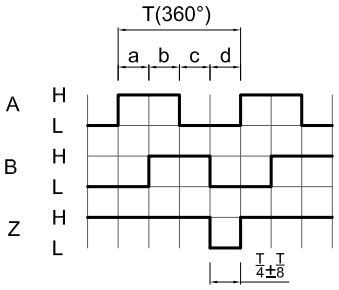
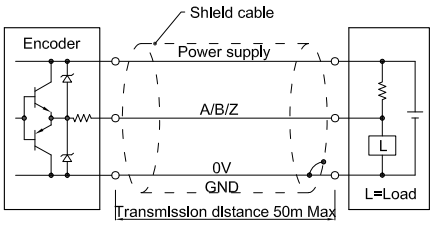
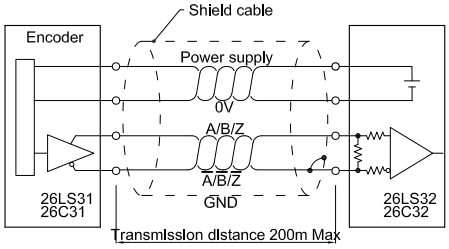
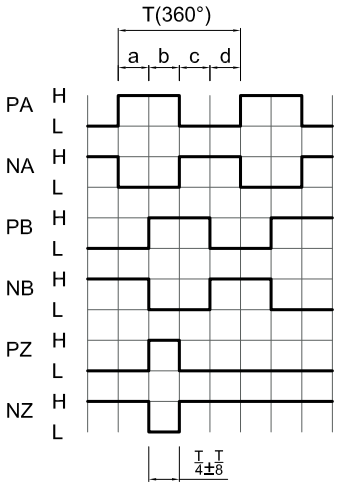
2. 2 Note

❶. Z signal is low level active.

❷. Z signal is high level active.

❸. None indicated for IP65 and cable length of 1M, if need to change the length C+number, the longest is 100M (expressed by C100). For the specific length of use, pls refer to page 2 of the provision of output circuit.

3. Output Mode

Electrical interface	Output circuit	Output wave form
OC NPN (open collector circuit)		 a.b.c.d=T/4±T/8 Phase A is ahead of B by T/4±T/8, Viewing from the front of encoder,direction is counterclockwise rotation (See dimensional drawings) CCW direction Z signal is low level active
F (Push-pull)		
TTL (DC5V) HTL (DC8-30V)		 a.b.c.d=T/4±T/8 Phase A is ahead of B by T/4±T/8, Viewing from the front of encoder,direction is counterclockwise rotation (See dimensional drawings) CCW direction

4. Electrical Parameters

Parameter / Electrical Interface / Item			OC	Push-pull	TTL	HTL
Supply voltage			DC+5V±5%；DC8V-30V±5%		DC+5V±5%	DC8-30V±5%
Consumption current			100mA Max		120mA Max	
Allowable ripple			≤3%rms			
Top response frequency			100KHz		200KHz	300KHz
Output capacity	Output current	Input	≤30mA	≤30mA	≤±20mA	≤±50mA
		Output	—	≤10mA		
	Output voltage	"H"	—	≥[(Supply voltage)-2.5V]	≥2.5V	≥Vcc-3 VDC
		"L"	≤0.4V	≤0.4V(30mA)	≤0.5V	≤ 1V VDC
	Load voltage		≤DC30V	—	—	
Rise & Fall time			Less than 2us(cable length: 2m)		Less than 1us (Cable length: 2m)	≤100ns
Insulation strength			AC500V 60s			
Insulation resistance			10MΩ			
Mark to space ratio			45% to 55%			
Reverse polarity protection			✔			
Short-circuit protection			—		✔❶	
Phase shift between A & B			90°±10° (frequency in low speed)			
			90°±20° (frequency in high speed)			
Origin motion			Low level available		—	
GND			not connect to encoder			

❶ Short-circuit to another channel or GND permitted for max.30s. ❷ Phase A.B.Z are back of phase U.V.W when power on.

5. Mechanical Specifications

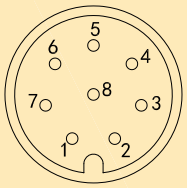
Diameter of shaft	Ø25mm; Ø30mm(stainless steel)
Starting torque	Less than 80×10^{-3} N·m
Inertia moment	Less than 100×10^{-6} kg·m²
Shaft load	Radial 70N; Axial 50N
Slew speed	≤3000 rpm
Shell material	Aluminium alloy
Weight	about 400g

6. Environmental Specifications

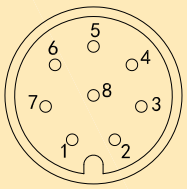
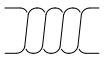
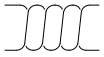
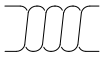
Environmental temperature	Operating:—20～+85°C(repeatable winding cable: -10°C); Storage:—25～+90°C
Environmental humidity	Operating and storage: 35～85%RH(noncondensing)
Vibration(Endurance)	Amplitude 0.75mm,5～55Hz,2h for X,Y,Z direction individually
Shock(Endurance)	1960m/s²,11ms three times for X,Y,Z direction individually
Protection	IP65

7. Wiring table

7.1 Table 1

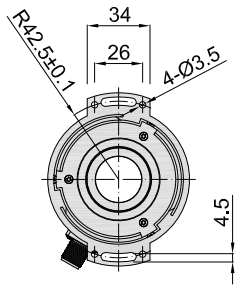
Socket pin definition (M12 8Pin male socket)		Function	Wire color (cable connection)	Explanation
	1	Up	Red	Power supply Positive terminal
	2	Un	Black	Power supply negative terminal
	3	A	White	A (one turn pulse signal)
	4	-	-	Unallocated
	5	B	Green	B (one turn pulse signal)
	6	-	-	Unallocated
	7	Z	Yellow	Z(zero signal)
	8	-	-	Unallocated
	GND	GND	GND	No encoder body connected

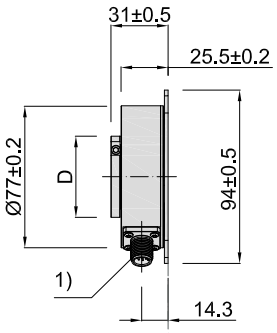
7.2 Table 2

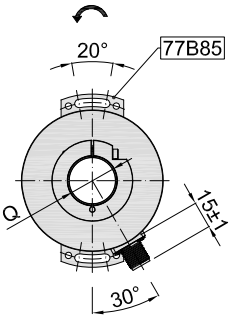
Socket pin definition (M12 8Pin male socket)		Function	Wire color (cable connection,Twisted pair)		Explanation
	1	Up	Red		Power supply
	2	Un	Black		
	3	A	White		A (one turn pulse signal)
	4	$\overline{A}$	White/BK		
	5	B	Green		B (one turn pulse signal)
	6	$\overline{B}$	Green/BK		
	7	Z	Yellow		Z(zero signal)
	8	$\overline{Z}$	Yellow/BK		
	GND	GND	GND	GND	No encoder body connected

8. Basic Dimensions

8.1 K77-C(Radial socket connection)



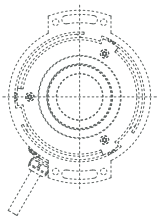


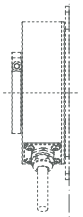


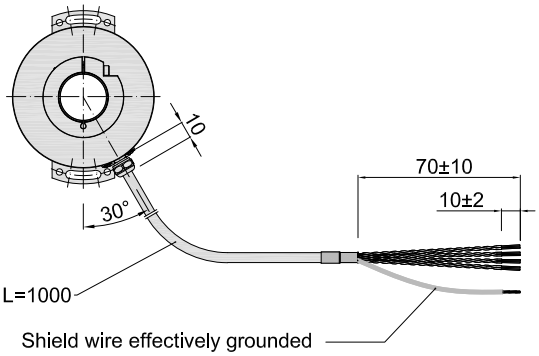
This side is the front of the encoder

Q(diameter of shaft)	D
$Ø25^{G7}_{(+0.007)}^{(+0.028)}$	Ø44
$Ø30^{G7}_{(+0.007)}^{(+0.028)}$	Ø46

8.2 K77-T(Radial cable connection)



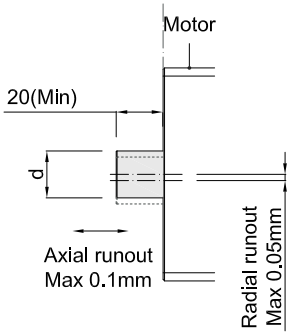


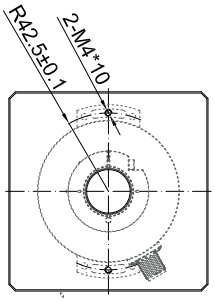


9. Assembly Requirements

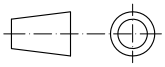
d
$Ø25_{g6}^{(-0.007}_{-0.020)}$
$Ø30_{g6}^{(-0.007}_{-0.020)}$

Mounting screws
Inner hexagon bolt
+flat washer
Specification: M4*10
Material: stainless steel
Quantity: 2





Unit: mm



77B85 = Mounting spring plate(stainless steel)

= Shaft rotation direction of the signal output

1) = M12 8Pin male socket

About vibration

Vibration act on encoder always cause wrong pulse, so we should pay attention to working place.More pulse per revolution, narrower groovy spacing of grating, more effect to encoder by vibration, when rev is low or stop, vibration act on shaft or main body would cause grating vibrating, so encoder might make wrong pulse.

10. Recommended Accessories

Plug and cable	Brief description	No.	Order No.
	C2C=Connection type head A: M12, 8-pin female straight connector; Connection type head B: M12, 8-pin male straight connector; Cable length: 2M 8-core with shield,halogen-free PUR	K77C2C	44400001
	C5C=Connection type head A: M12, 8-pin female straight connector; Connection type head B: M12, 8-pin male straight connector; Cable length: 5M 8-core with shield,halogen-free PUR	K77C5C	44400002
	C1=Connection type head A: M12, 8-pin female straight connector; Connection type head B: Bare wire end; Cable length: 1M 8-core with shield,halogen-free PUR	K77C1	44400003
	C2=Connection type head A: M12, 8-pin female straight connector; Connection type head B: Bare wire end; Cable length: 2M 8-core with shield,halogen-free PUR	K77C2	44400004
	C5=Connection type head A: M12, 8-pin female straight connector; Connection type head B: Bare wire end; Cable length: 5M 8-core with shield,halogen-free PUR	K77C5	44400005